

ATTACHMENT F.3

**CLOSURE PLAN FOR THE TECHNICAL AREA 55
CEMENTATION UNIT**

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<u>TABLE NO.</u>	<u>TITLE</u>
F.3-1	Closure Schedule

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LIST OF FIGURES

<u>FIGURE NO.</u>	<u>TITLE</u>
F.3-1	Technical Area (TA) 55 Cementation Unit Location

LIST OF ABBREVIATIONS/ACRONYMS

20.4.1 NMAC	New Mexico Administrative Code, Title 20, Chapter 4, Part 1
COPC	constituents of potential concern
CSU	container storage unit
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
LANL	Los Alamos National Laboratory
LASO	Los Alamos Site Office
NMED	New Mexico Environment Department
NMT	Nuclear Materials Technology
NNSA	National Nuclear Security Administration
PPE	personal protective equipment
QA	quality assurance
QC	quality control
RCRA	Resource Conservation and Recovery Act
SAP	sampling and analysis plan
SWRC	Solid Waste Regulatory Compliance
TA	technical area

**ATTACHMENT F.3
CLOSURE PLAN FOR THE TECHNICAL AREA 55
CEMENTATION UNIT**

The information provided in this closure plan is submitted to address the applicable closure requirements specified in the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC) §270.14(b)(13), and 20.4.1 NMAC, Subpart V, Part 264, Subparts G and X, revised June 14, 2000. This closure plan describes the activities necessary to perform Resource Conservation and Recovery Act (RCRA) closure for the cementation unit at Los Alamos National Laboratory (LANL) Technical Area (TA) 55. Closure activities will include removal of any remaining waste, decontamination or removal of contaminated equipment/structures, and verification that all residues have been removed. Closure will minimize the need for further maintenance, preclude the release of hazardous constituents to environmental media, and be protective of human health in accordance with the closure performance standards specified in 20.4.1 NMAC §264.111 [6-14-00].

The cementation unit is located at TA-55-4, Room 401. It consists of a pH column, vacuum trap, two motor-driven mixers, four impellers, and piping inside of a glove box. Figure F.3-1 shows the location of the cementation unit. This closure plan will be used to provide guidance and permit conditions for the partial closure of the cementation unit. Closure will occur separately from the other waste management units at TA-55 and over the active life of the TA-55 facility, which is not anticipated to end before 2050.

This closure plan describes general closure and establishes the procedure of submitting a separate detailed sampling and analysis plan (SAP) to the New Mexico Environment Department (NMED) for approval at the time of closure. The SAP will alleviate the need for future closure plan and permit modification until the actual closure activities for the cementation unit are scheduled. The SAP will provide the required level of detail to assure that closure performance standards are met, consistent with the appropriate decontamination and verification requirements existing at the time of closure.

This plan is organized as follows:

- Section F.3.1 - General Closure Information.
- Section F.3.2 - Description of the Cementation Unit.
- Section F.3.3 - Closure Procedures.
- Section F.3.4 - Sampling and Analysis Plan.
- Section F.3.5 – References.

Until closure is complete and has been certified in accordance with 20.4.1 NMAC §264.115 [6-14-00], as discussed in Section F.3.1.6, a copy of the approved closure plan and any approved revisions will be on file at with Risk Reduction and Environmental Stewardship Division Solid Waste Regulatory Compliance Group (SWRC) and at the U.S. Department of Energy (DOE)/National Nuclear Security Administration (NNSA) Los Alamos Site Office (LASO).

F.3.1 GENERAL CLOSURE INFORMATION

F.3.1.1 Closure Performance Standard [20.4.1 NMAC §264.111]

The cementation unit addressed in this closure plan will be closed to meet the following performance standards:

- Minimize the need for further maintenance.
- Control, minimize, or eliminate, to the extent necessary to protect human health and the environment, the post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the ground or surface waters or atmosphere.
- Comply with the closure and post closure requirements of 20.4.1 NMAC, Subpart V, Part 264, Subparts G and X [6-14-00].

This will be accomplished by removal of waste from the cementation unit and decontamination, if necessary, of the areas that may have come into contact with wastes. Decontamination activities will ensure the removal of hazardous waste residues from the cementation unit to established cleanup levels.

F.3.1.2 Partial and Final Closure Activities [20.4.1 NMAC §§264.112 (b)(2) and 264.112(d)]

This closure plan has been written for partial closure rather than final closure of the entire LANL facility. Partial RCRA closure is the closure of a hazardous waste management unit at a facility that contains other active hazardous waste management units. Partial closure at TA-55 can consist of closing the cementation unit, while leaving the other units in operation. Partial closure (hereinafter referred to as closure) will be deemed complete when the waste has been removed from the cementation unit; all related secondary containment surfaces and equipment have been decontaminated, if necessary, or otherwise properly disposed; closure has been verified; and the closure certification has been submitted to and approved by the NMED.

Final RCRA closure of the LANL hazardous waste management facility will occur when all of LANL's hazardous/mixed waste management units are closed. Final closure will consist of assembling documentation on the closure status of each waste management unit, including all previous closures

as well as land-based units where closures have been or are being addressed via alternative closure requirements. Final closure will be deemed complete when the closure certification has been submitted to the NMED, and the NMED has approved the final closure.

F.3.1.3 General Closure Schedule [20.4.1 NMAC §§264.112(b)(6), 264.112(e), and 264.113]

Written notification will be provided to the NMED 45 days before the start of closure activities for the TA-55 cementation unit. However, pursuant to 20.4.1 NMAC §264.112(e) [6-14-00], removing hazardous wastes and decontaminating or dismantling equipment in accordance with an approved closure plan may be conducted at any time before or after notification of closure. Closure activities will begin according to the requirements of 20.4.1 NMAC §264.112(d)(2) [6-14-00]. Treatment, removal, or disposal of hazardous wastes will begin in accordance with the approved closure plan, as required by 20.4.1 NMAC §264.113(a) [6-14-00], within 90 days after final receipt of waste at the cementation unit. In the event that closure activities cannot begin within 90 days, LANL will notify the Secretary of the NMED in accordance with the extension requirements in 20.4.1 NMAC §264.113(a) [6-14-00]. Closure activities and reporting requirements will then be completed within 180 days of the receipt of the final volume of waste at the cementation unit. Closure will be conducted in accordance with the schedule presented in Table F.3-1 of this closure plan.

**Table F.3-1
Closure Schedule**

Activity	Maximum Time Required ^a
Submit SAP.	-90 Days
Notify the NMED of intent to close.	-45 Days
Final receipt of waste.	Day 0
Remove waste.	Day 5
Decontaminate surfaces and equipment.	Day 20
Sample excess used decontamination water for disposal.	Day 20
Perform verification sampling.	Day 30
Evaluate analytical data from verification sampling.	Day 50
Perform additional decontamination, if necessary.	Day 55
Perform additional verification sampling, if necessary.	Day 60
Evaluate additional analytical data.	Day 75
Perform final clean up and disposal (i.e., removal of decontaminated equipment and decontamination waste).	Day 140
Certify closure.	Day 175
Submit closure certification to NMED.	Day 180

^a The schedule above indicates calendar days from the beginning by which activities will be completed. Some activities may be conducted simultaneously and/or may not require the maximum time listed.

NMED = New Mexico Environment Department
SAP = sampling and analysis plan

Further details regarding the schedule of closure activities will be included with the SAP as discussed in Section F.3.4 of this closure plan. In the event that closure is prevented from proceeding according

to schedule, LANL will notify the Secretary of the NMED in accordance with extension request requirements in 20.4.1 NMAC §264.113(b) [6-14-00]. In addition, the demonstrations in 20.4.1 NMAC §264.113(a)(1) and (b)(1) [6-14-00], will be made in accordance with 20.4.1 NMAC §264.113(c) [6-14-00].

F.3.1.4 Amendment of the Closure Plan [20.4.1 NMAC §264.112(c)]

In accordance with 20.4.1 NMAC §264.112(c) [6-14-00], LANL will submit a written notification of or request for a permit modification to authorize a change in the approved closure plan whenever:

- There are changes in operating plans or facility design that affect the closure plan.
- There is a change in the expected year of closure.
- Unexpected events occur during closure that require modification of the approved closure plan.

The written notification or request will include a copy of the amended closure plan for approval by the NMED.

LANL will submit a written request for a permit modification with a copy of the amended closure plan at least 60 days prior to the proposed change in unit design or operation or no later than 60 days after an occurrence of an unexpected event that affects the closure plan. If the unexpected event occurs during closure, the permit modification will be requested within 30 days of the occurrence. The Secretary of the NMED may request a modification of the closure plan under the conditions presented in the bulleted items above. LANL will submit a modified plan in accordance with the request within 60 days of notification, or within 30 days of notification if a change in facility condition occurs during the closure process.

F.3.1.5 Closure Cost Estimate, Financial Assurance, and Liability Requirements [20.4.1 NMAC §264.140(c)]

In accordance with 20.4.1 NMAC §264.140(c) [6-14-00], LANL, as a federal facility, is exempt from the requirements of 20.4.1 NMAC, Subpart V, Part 264, Subpart H [6-14-00], to provide a cost estimate, financial assurance mechanisms, and liability insurance for closure actions.

F.3.1.6 Closure Certification [20.4.1 NMAC §264.115]

Within 60 days after completion of closure activities for the cementation unit or final closure of the facility, LANL will submit to the Secretary of the NMED, via certified mail, a certification that the unit or facility has been closed in accordance with the approved closure plan. The certification will be signed by the appropriate DOE/NNSA and LANL officials and by an independent, registered professional

engineer, in accordance with 20.4.1 NMAC §264.115 [6-14-00]. Documentation supporting the independent, registered engineer's certification will be furnished to the Secretary of the NMED upon request, as specified in 20.4.1 NMAC §264.115 [6-14-00]. A copy of the certification and supporting documentation will be maintained by both the DOE/NNSA LASO and SWRC.

F.3.1.7 Security

Because of the ongoing nature of waste management operations at TA-55, site security and administrative controls at the TA-55 waste management units will be maintained by the DOE/NNSA or another authorized federal agency for as long as necessary to prohibit public access. The security fence at TA-55 will be maintained to ensure that public access into TA-55 is prevented.

F.3.1.8 Closure Report

Upon completion of RCRA closure activities at the cementation unit, a closure report will be prepared and provided to the Secretary of the NMED. The report will document the closure and contain, for example, the following:

- A copy of the certification described in Section F.3.1.6 of this closure plan.
- A general summary of closure activities.
- Any variance from the approved activities and the reason for the variance.
- A summary of any sampling data associated with the closure.
- The location of the file of supporting documentation (e.g., memos, logbooks, laboratory data).
- Storage or disposal location of regulated hazardous/mixed waste resulting from closure activities.
- A certification of accuracy of the report.

F.3.1.9 Survey Plat and Post-Closure Requirements [20.4.1 NMAC §§264.116 and 264.117 through 264.120]

LANL intends to remove the /mixed waste and associated constituents from the cementation unit and decontaminate all surfaces and equipment to established cleanup levels or, if the cleanup levels cannot be achieved, to dispose of the contaminated surfaces and equipment. If decontamination to established cleanup levels is not achievable, LANL may propose an alternate demonstration of decontamination, as circumstances indicate. A survey plat, post-closure certification, and post-closure notices will not be required because all wastes will be removed and any surfaces and equipment will be decontaminated or disposed of at closure. Therefore, these requirements are not applicable for clean-closed units.

F.3.2 DESCRIPTION OF THE CEMENTATION UNIT

TA-55 is located on a mesa between a branch of Mortandad Canyon to the north and Two Mile Canyon to the south. Mesa-top elevations at TA-55 range from approximately 7,100 to 7,300 feet above mean sea level. TA-55 began operating in 1978 and is the location of research and development activities including a plutonium processing facility. The cementation unit is located at TA-55 in glovebox GB-454 along the west wall of TA-55-4, Room 401. The unit is used to stabilize mixed waste solutions into a cement matrix. It consists of a pH column, vacuum trap, two motor-driven mixers, four impellers, piping and glovebox.

LANL does not currently intend to reduce the design capacity of the cementation unit at TA-55 during the active life of the unit. Estimated annual quantities for the cementation unit at TA-55 are provided in the most recent version of the "Los Alamos National Laboratory General Part A Permit Application," hereinafter referred to as the LANL General Part A.

F.3.2.1 Estimate of Maximum Waste Treated

The maximum total volume of mixed waste that may be in inventory in the cementation unit at any time is estimated at 150 gallons. Treatment at TA-55 using the cementation unit commenced in 1987 and is projected to continue until the facility is decommissioned in 2050. The estimated lifetime treatment capacity for the unit is approximately 226,800 gallons.

F.3.2.2 Description of Stored Waste

The cementation unit is used to treat liquid and solid mixed waste generated primarily from research and development activities and processing and recovery operations at TA-55 and at the Chemistry and Metallurgy Research Building at TA-3. The liquid wastes consist of evaporator bottoms solutions and laboratory solutions that exhibit the hazardous characteristics of corrosivity and toxicity (for metals) as

defined in 20.4.1 NMAC §261.22 and 261.24 [6-14-00], respectively. The solid process wastes consist of process residue from the evaporator, process leached solids, and filter cake. These waste streams exhibit the hazardous characteristics of toxicity (for metals) and corrosivity and are classified as mixed waste. Mixed waste has both a hazardous component (as defined by 20.4.1 NMAC, Subpart II, Part 261) and a radioactive component. Information on the hazardous components of the wastes that can be treated by cementation unit is provided in the most recent version of the LANL General Part A. Additional information on waste generating activities at LANL is available in the waste analysis plan in Appendix B of the most recent version of the LANL General Part B.

The estimated annual quantities of waste treated in the cementation unit are provided in the most recent version of the LANL General Part A.

F.3.3 CLOSURE PROCEDURES [20.4.1 NMAC §264.112(b)(4) and (5), and 264.114]

Closure will be conducted in accordance with the schedule presented in Table F.2-1, as amended by the SAP submitted at the time of closure. Closure will generally be conducted as follows:

- **Removal of Waste** – Treatment of any remaining solutions in the unit at the time of closure.
- **Preliminary Closure** - Safety precautions and background contaminant levels for the cementation unit will be assessed. Inspection of the secondary containment surfaces by the engineer observing the closure to ensure adequate containment and conditions for closure.
- **Decontamination** – Removal of potential hazardous waste constituents from equipment used during waste management activities; and all surfaces, walls, and secondary containment features (e.g., surfaces, sumps, berms, and/or recessed drains). Removal can include dismantling, sweeping, vacuuming, moping, and/or wiping as appropriate at the time of closure and based upon the contaminant levels determined by the operating record of the unit.
- **Verification** – Sampling to verify that residual hazardous waste constituents have been decontaminated to appropriate levels. Sample media can include swipes, solutions, and/or solid samples as appropriate and will be determined at the time of closure based upon the operating record of the unit.
- **Closure Certification** – Certification by a professional engineer that the procedures and requirements provided in this closure plan and the SAP were followed.

The following sections provide additional information for the closure procedures described above. The SAP provided at the time of closure will provide detailed information regarding the preliminary closure procedures, decontamination methods, and verifications procedures as applicable at the time of closure.

F.3.3.1 Removal of Waste

Prior to the initiation of closure activities, any waste remaining in the cementation unit will be removed or treated according to current waste-specific standard operating procedures. Once the waste has been removed or treated, the drum(s) of solidified waste will be removed and transported to an approved on-site facility or a permitted off-site treatment, storage, and disposal facility.

F.3.3.2 Preliminary Closure Procedures

F.3.3.2.1 Safety Precautions

Job hazards associated with closure activities will be identified, controls developed, and workers briefed before closure activities are conducted, in accordance with LANL safety procedures. Personnel involved in closure activities will wear appropriate personal protective equipment (PPE), specified by the Health Physics Group and the Industrial Hygiene and Safety Group, and will follow good hygiene practices to protect themselves from exposure to mixed waste. The level of PPE that will be required will depend upon the physical hazards present and the levels of contamination that are detected, if any. All workers involved in closure activities will be required to have appropriate training (as identified in Attachment D of this permit application and Appendix D in the most recent version of the LANL General Part B. Contaminated PPE will either be decontaminated or managed in compliance with appropriate waste management regulations.

F.3.3.2.2 Background Determination

Prior to the commencement of decontamination, the operating record will be evaluated to determine the constituents of potential concern (COPCs) during closure. In addition, background samples and/or concentrations derived from LANL studies developed under the LANL corrective action or other programs can be used to determine COPC background/baseline levels applicable at the time of closure. The COPCs, appropriate background levels, and/or necessary sample collection techniques will be determined at the time of closure and included in the SAP at the time of closure, as discussed in Section F.3.4 of this closure plan.

F.3.3.2.3 Structural Assessment

Prior to beginning decontamination activities, the glovebox and secondary containment associated with the cementation unit will be inspected for any cracks or conditions that would potentially lead to the loss of decontamination-liquid containment. Preventative maintenance inspections are conducted routinely (i.e., weekly). If any defects, deterioration, damage, or hazards affecting containment are discovered during inspection, appropriate remedial actions (including repairs, maintenance, or replacement) will be completed before decontamination activities begin. If a crack or gap is present, a

swipe sample or a representative sample of the media will be taken (e.g., concrete) to determine the presence of contamination. The sample will be analyzed for the COPCs identified based upon the operating history of the unit, as discussed in Section F.3.3.2.2. If contamination is detected, the surface flaw will be decontaminated prior to repairing the crack/gap. Complete or partial removal (e.g., cold milling) of the material may be performed until contamination is no longer detected. If partial removal is successful in eliminating the contamination, it will be assumed that the remaining material, including the underlying soil, is clean.

F.3.3.3 Decontamination Procedures

To the extent possible, all contaminated surfaces and equipment (if present) will be decontaminated. Surfaces, items, materials, and equipment that cannot be decontaminated will be containerized and managed in compliance with appropriate waste management regulations.

An appropriate surfactant/solvent to be used in wash water solutions will be determined based upon the COPCs identified in the SAP. Alconox[®], a surfactant, will be used to decontaminate the cementation unit. Specialized solvents will be used for more focused decontamination/removal purposes, as appropriate.

F.3.3.3.1 Cementation Unit and Glovebox

The cementation unit equipment (e.g., pH column, vacuum trap, motor-driven mixers, impellers) and glovebox will either be decontaminated, decommissioned, or dismantled, depending on the extent of contamination and anticipated disposition or use after closure. If the cementation unit equipment and/or the glovebox is to be decommissioned or dismantled, the resulting components will be containerized and managed appropriately at an approved on-site facility, depending on the regulated constituents present. If the cementation unit equipment and/or the glovebox is to be decontaminated, Nuclear Materials Technology (NMT) personnel will use the following procedures.

Prior to decontamination of any of the cementation unit equipment, any visible material located inside the glovebox will be removed to the extent possible and managed in compliance with appropriate regulations. The cementation unit equipment (while located inside the glovebox) and interior surfaces of the glovebox will be rinsed or flushed with wash water or wiped down with cloths and/or other absorbent materials. Used wash water will be collected, removed, and transferred to an appropriate container for storage pending the results of analysis and disposal.

Verification of decontamination will be conducted as indicated in Section F.3.3.4. If the analysis from the verification indicates that mixed waste constituents are present, decontamination wash cycles and analyses will continue until the ancillary equipment has been decontaminated or the decision is made to manage it appropriately as contaminated waste. Upon determination that it is contaminated waste, the material/structure/surface may be removed, transported to, and stored at an appropriate container storage unit (CSU) to facilitate the closure process.

F.3.3.3.2 Ancillary Equipment

The cementation unit ancillary equipment located inside Room 401 (outside the glovebox) will either be decontaminated, decommissioned, or dismantled, depending on the extent of contamination and anticipated disposition or use after closure. If any of the cementation unit ancillary equipment is to be decommissioned or dismantled, the resulting components will be containerized and managed appropriately at an approved on-site facility, depending on the regulated constituents present. If decontamination measures are deemed appropriate, NMT personnel will use the following procedures for surface decontamination of the cementation unit ancillary equipment.

Random swipe samples from the areas adjacent to the cementation unit ancillary equipment (e.g., walls, floors, sumps, and drains) will be collected and analyzed for the COPCs expected to be present, based on the operating record. If decontamination measures are deemed necessary based on the analytical results, the following procedures will be used.

Decontamination will be conducted using mops, cloths, and/or other absorbent materials to remove any potential mixed waste constituents. These materials will be submerged in a wash water solution (e.g., Alconox, water) and used to wipe down the surfaces associated with the cementation unit. After decontamination of the surfaces, the containment system (e.g., recessed areas, sumps, berms) will be wiped down. Used wash water will be collected, removed, and transferred to an appropriate container for storage pending the results of analysis and disposal.

Verification of decontamination will be conducted as indicated in Section F.3.3.4. If the analysis from the verification indicates that mixed waste constituents are present, decontamination wash cycles and analyses will continue until the structure and surfaces have been decontaminated or the decision is made to manage it appropriately as contaminated waste. Upon determination that it is contaminated waste, the material/structure/surface may be removed, transported to, and stored at an appropriate CSU to facilitate the closure process.

F.3.3.3.3 Areas Adjacent to the Cementation Unit Glovebox

Random swipe samples from the areas adjacent to the cementation unit glovebox (e.g., walls, floors, sumps, and drains) will be collected and analyzed for the COPCs expected to be present, based on the operating record. If decontamination measures are deemed necessary based on the analytical results, the following procedures will be used.

Decontamination will be conducted using mops, cloths, and/or other absorbent materials to remove any potential mixed waste constituents. These materials will be submerged in a wash water solution (e.g., Alconox, water) and used to wipe down the surfaces associated with the areas adjacent to the cementation unit glovebox. After decontamination of the surfaces, the containment system (e.g., recessed areas, sumps, berms) will be wiped down. Used wash water will be collected, removed, and transferred to an appropriate container for storage pending the results of analysis and disposal.

Verification of decontamination will be conducted as indicated in Section F.3.3.4. If the analysis from the verification indicates that mixed waste constituents are present, decontamination wash cycles and analyses will continue until the structure and surfaces have been decontaminated or the decision is made to manage it appropriately as contaminated waste. Upon determination that it is contaminated waste, the material/structure/surface may be removed, transported to, and stored at an appropriate CSU to facilitate the closure process.

F.3.3.3.4 Equipment Used During Closure

Reusable protective clothing, tools, and equipment used during decontamination activities will be cleaned with a wash water solution. If reusable sampling equipment is used, sampling equipment rinsate blanks will be collected and analyzed in accordance with the quality assurance (QA)/quality control (QC) procedures to be described in the closure SAP. Reusable decontamination equipment, including protective clothing and tools used during closure activities will be scraped as necessary to remove any residue and cleaned with a wash water solution. Residue, disposable equipment and reusable equipment that cannot be decontaminated will be containerized and managed as waste in accordance with LANL waste management procedures, depending on the regulated constituents present.

F.3.3.4 Verification of Decontamination

Verification of decontamination will be conducted using sampling and analysis to demonstrate that hazardous waste residues are not present on the equipment and/or surfaces associated with the cementation unit (as applicable). Sample media can include wash water solutions, swipes, and/or

solid media samples (e.g., soil, concrete) as determined in the SAP at the time of closure and the operating record of the unit. The sampling methodology will be based on factors such as COPCs and the materials of construction. All sampling conducted during closure will be done in accordance with QA/QC procedures defined by "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846) (U.S. Environmental Protection Agency [EPA], 1986). The SAP will establish the minimum number of verification samples to be collected based on the total surface area associated with the unit. Verification sampling will use a biased random approach for the determination of sample locations for the equipment, structures, and/or surfaces and will include known or likely areas of contamination (e.g., low areas, sumps, and known spill locations) as determined by the operating record of the unit at the time of closure.

Decontamination will be verified if the analytical data from the collected samples meets at least one of the decontamination criteria listed in Section F.3.3.5 of this closure plan. If the data cannot meet at least one of the criteria, additional sampling can be performed to establish the boundaries of the contamination. Decontamination, as discussed in Section F.3.3.3, will be repeated within those boundaries, using portable berms or other appropriate materials to limit the potential for runoff from the affected area. An additional round of verification sampling will be performed for all of the areas previously determined to be contaminated. After each decontamination/verification sequence, a decision will be made to repeat or remove the contaminated materials and dispose of them properly.

F.3.3.5 Decontamination Criteria

Successful decontamination will consist of sampling as specified in the component-specific SAP and meet one of the following criteria:

- No detectable hazardous waste or hazardous waste constituents from cementation unit activities are identified in the verification sample.
- Detectable hazardous waste or hazardous waste constituents from cementation unit in the verification sample are removed to statistically significant levels based on concentrations in the background/baseline samples.
- Detectable hazardous waste or hazardous waste constituents from cementation unit in the verification sample are at or below levels agreed upon with the NMED.
- Detectable hazardous waste or hazardous waste constituent concentrations from cementation unit activities do not significantly decrease after several wash downs. In such an event, hazardous constituents that pose an acceptable risk will be allowed to remain, as mutually agreed upon with the NMED.

An alternative demonstration of decontamination may be proposed and justified at the time of closure as circumstances dictate. The NMED will evaluate the proposed alternative in accordance with the

standards and guidance then in effect and, if approved, LANL will incorporate the alternative into the SAP at the time of closure.

F.3.4 SAMPLING AND ANALYTICAL PROCEDURES [20.4.1 NMAC §264.112(b)(4)]

Sampling and analysis will be performed using standard approved methods (e.g., *SW-846*, American Society for Technology and Materials), as appropriate, for making closure decontamination verification determinations. LANL will submit a SAP to the NMED at the time of closure notification for review and approval. The SAP will provide a detailed description of the cementation unit and propose a closure methodology that assures the closure performance standards in Section F.3.1.1 are met.

The SAP will include at a minimum the following information:

- A detailed discussion of site characteristics.
- The cementation unit, ancillary equipment and/or associated glovebox operational history, to include descriptions of known spills, releases, and/or evidence of potential problems (e.g., visual stains, dead vegetation, solid waste management units).
- Chemical properties of the waste stored and processed at the unit and/or glovebox.
- Determination of applicable COPCs.
- A hazard control plan, including a review of chemical hazards present at the site, control and monitoring methods and procedures, and required PPE.
- Determination of wash water solution composition, if necessary.
- Detailed procedures describing decontamination methods for equipment, structures, and media.
- Discussion of background levels determined through sampling or use of published data and their relevance to the unit and/or glovebox.
- Methods for sampling and analysis of contaminated media.
- Removal procedures for contaminated media, if necessary.
- Sampling methods for decontamination media and hazardous waste determination. The discussion should include the rationale for using wash water samples, swipe samples, soil samples, and/or other sampling methodology.
- Sampling methods for decontamination verification procedures. The discussion should include the statistical or judgmental basis for determining the number of verification samples needed and the constituents to be analyzed.
- Sampling equipment decontamination and disposition procedures.
- Sample handling and documentation procedures.
- Analytical methods (including detection limits) and the rationale for their determination.
- Disposition of removed waste, decontamination media, or contaminated soils. This discussion should include an identification of proposed on- or off-site hazardous waste management

facilities that may be used for final disposition and the types of wastes anticipated to be shipped.

- Decontamination criteria.
- Statistical basis for verification of decontamination, if applicable. The discussion should include information on determination of statistical increases in analytical parameters and numerical values for significant increases.
- Risk assessment procedures to be used, if necessary.
- Field and laboratory QA/QC procedures.
- Schedule of closure activities, including decontamination, sampling, analysis, potential removal of soils, and closure certification submittal.
- Identification of contact person or office.

F.3.5 REFERENCES

EPA, 1986 and all approved updates, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," *EPA-SW-846*, Office of Solid Waste and Emergency Response, U.S. Government Printing Office, Washington, D.C.